

AAGCTCAGAT	CTACCTGCCT	GAGGGCGTCC	GGTTCCAGCT	GGCCCTTCCC	GAGGGGGAGA	60
GGGAGGCCGT	TCTAAAAGCC	CTTCAGGACG	CTACCCGGGG	GCGGGTGGTG	GAAGGGTAAC	120
ATG AGG GGG ATG CTG CCC CTC TTT GAG CCC AAG GGC CGG GTC CTC CTG						168
Met Arg Gly Met Leu Pro Leu Phe Glu Pro Lys Gly Arg Val Leu Leu						
1 5 10 15						
GTG GAC GGC CAC CAC CTG GCC TAC CGC ACC TTC CAC GCC CTG AAG GGC						216
Val Asp Gly His His Leu Ala Tyr Arg Thr Phe His Ala Leu Lys Gly						
20 25 30 35						
CTC ACC ACC AGC CGG GGG GAG CCG GTG CAG GCG GTC TAC GGC TTC GCC						264
Leu Thr Thr Ser Arg Gly Glu Pro Val Gln Ala Val Tyr Gly Phe Ala						
35 40 45						
AAG AGC CTC CTC AAG GCC CTC AAG GAG GAC GGG GAC GCG GTG ATC GTG						312
Lys Ser Leu Leu Lys Ala Leu Lys Glu Asp Gly Asp Ala Val Ile Val						
50 55 60						
GTC TTT GAC GCC AAG GCC CCC TCC TTC CGC CAC GAG GCC TAC GGG GGG						360
Val Phe Asp Ala Lys Ala Pro Ser Phe Arg His Glu Ala Tyr Gly Gly						
65 70 75 80						
TAC AAG GCG GGC CGG GCC CCC ACG CCG GAG GAC TTT CCC CGG CAA CTC						408
Tyr Lys Ala Gly Arg Ala Pro Thr Pro Glu Asp Phe Pro Arg Gln Leu						
85 90 95						
GCC CTC ATC AAG GAG CTG GTG GAC CTC CTG GGG CTG GCG CGC CTC GAG						456
Ala Leu Ile Lys Glu Leu Val Asp Leu Leu Gly Leu Ala Arg Leu Glu						
100 105 110						
GTC CCG GGC TAC GAG GCG GAC GAC GTC CTG GCC AGC CTG GCC AAG AAG						504
Val Pro Gly Tyr Glu Ala Asp Asp Val Leu Ala Ser Leu Ala Lys Lys						
115 120 125						
GCG GAA AAG GAG GGC TAC GAG GTC CGC ATC CTC ACC GCC GAC AAA GAC						552
Ala Glu Lys Glu Gly Tyr Glu Val Arg Ile Leu Thr Ala Asp Lys Asp						
130 135 140						
CTT TAC CAG CTC CTT TCC GAC CGC ATC CAC GTC CTC CAC CCC GAG GGG						600
Leu Tyr Gln Leu Leu Ser Asp Arg Ile His Val Leu His Pro Glu Gly						
145 150 155 160						
TAC CTC ATC ACC CCG GCC TGG CTT TGG GAA AAG TAC GGC CTG AGG CCC						648
Tyr Leu Ile Thr Pro Ala Trp Leu Trp Glu Lys Tyr Gly Leu Arg Pro						
165 170 175						
GAC CAG TGG GCC GAC TAC CGG GCC CTG ACC GGG GAC GAG TCC GAC AAC						696
Asp Gln Trp Ala Asp Tyr Arg Ala Leu Thr Gly Asp Glu Ser Asp Asn						
180 185 190						
CTT CCC GGG GTC AAG GGC ATC GGG GAG AAG ACG GCG AGG AAG CTT CTG						744
Leu Pro Gly Val Lys Gly Ile Gly Glu Lys Thr Ala Arg Lys Leu Leu						
195 200 205						

FIG. 1A

GAG	GAG	TGG	GGG	AGC	CTG	GAA	GCC	CTC	CTC	AAG	AAC	CTG	GAC	CGG	CTG	792	
Glu	Gl	Trp	Gly	Ser	Leu	Glu	Ala	Leu	Leu	Lys	Asn	Leu	Asp	Arg	Leu		
210				215						220							
AAG	CCC	GCC	ATC	CGG	GAG	AAG	ATC	CTG	GCC	CAC	ATG	GAC	GAT	CTG	AAG	840	
Lys	Pro	Ala	Ile	Arg	Glu	Lys	Ile	Leu	Ala	His	Met	Asp	Asp	Leu	Lys		
225				230					235								
CTC	TCC	TGG	GAC	CTG	GCC	AAG	GTG	CGC	ACC	GAC	CTG	CCC	CTG	GAG	GTG	888	
Leu	Ser	Trp	Asp	Leu	Ala	Lys	Val	Arg	250	Thr	Asp	Leu	Pro	Leu	Glu	Val	
				245					255								
GAC	TTC	GCC	AAA	AGG	CGG	GAG	CCC	GAC	CGG	GAG	AGG	CTT	AGG	GCC	TTT	936	
Asp	Phe	Ala	Lys	Arg	Arg	Glu	Pro	Asp	Arg	Glu	Arg	Leu	Arg	Ala	Phe		
				260				265				270					
CTG	GAG	AGG	CTT	GAG	TTT	GGC	AGC	CTC	CTC	CAC	GAG	TTC	GGC	CTT	CTG	984	
Leu	Gl	Arg	Leu	Glu	Phe	Gly	Ser	Leu	Leu	His	Glu	Phe	Glu	Leu	Leu		
			275			280				285							
GAA	AGC	CCC	AAG	GCC	CTG	GAG	GAG	GCC	CCC	TGG	CCC	CCG	CCG	GAA	GGG	1032	
Glu	Ser	Pro	Lys	Ala	Leu	Glu	Glu	Ala	Pro	Trp	Pro	Pro	Pro	Glu	Gly		
			290			295			300								
GCC	TTC	GTG	GGC	TTT	GTG	CTT	TCC	CGC	AAG	GAG	CCC	ATG	TGG	GCC	GAT	1080	
Ala	Phe	Val	Gly	Phe	Val	310	Leu	Ser	Arg	Lys	315	Glu	Pro	Met	Trp	Ala	Asp
															320		
CTT	CTG	GCC	CTG	GCC	GCC	AGG	GGG	GGC	CGG	GTC	CAC	CGG	GCC	CCC	CCC	1128	
Leu	Leu	Ala	Leu	Ala	Ala	Arg	Gly	Gly	Arg	Val	His	Arg	Ala	Pro			
				325				330			335						
GAG	CCT	TAT	AAA	GCC	CTC	AGG	GAC	CTG	AAG	GAG	GCG	CGG	GGG	CTT	CTC	1176	
Glu	Pro	Tyr	Lys	Ala	Leu	Arg	Asp	Leu	Lys	Gl	Ala	Arg	Gly	Leu	Leu		
			340				345			350							
GCC	AAA	GAC	CTG	AGC	GTT	CTG	GCC	CTG	AGG	GAA	GGC	CTT	GGC	CTC	CCG	1224	
Ala	Lys	Asp	Leu	Ser	Val	Leu	Ala	Leu	Arg	Glu	Gly	Leu	Gly	Leu	Pro		
			355			360				365							
CCC	GGC	GAC	GAC	CCC	ATG	CTC	CTC	GCC	TAC	CTC	CTG	GAC	CCT	TCC	AAC	1272	
Pro	Gly	Asp	Asp	Pro	Met	Leu	Leu	Ala	Tyr	Leu	Leu	Asp	Pro	Ser	Asn		
			370			375				380							
ACC	ACC	CCC	GAG	GGG	GTG	GCC	CGG	CGC	TAC	GGC	GGG	GAG	TGG	ACG	GAG	1320	
Thr	Thr	Pro	Glu	Gly	Val	Ala	Arg	Arg	Tyr	Gly	Gly	Gl	Trp	Thr	Glu		
				385					395								
GAG	GCG	GGG	GAG	CGG	GCC	GCC	CTT	TCC	GAG	AGG	CTC	TTC	GCC	AAC	CTG	1368	
Glu	Ala	Gly	Glu	Arg	Ala	Ala	Leu	Ser	Gl	Arg	Leu	Phe	Ala	Asn	Leu		
				405				410					415				
TGG	GGG	AGG	CTT	GAG	GGG	GAG	GAG	AGG	CTC	CTT	TGG	CTT	TAC	CGG	GAG	1416	
Trp	Gly	Arg	Leu	Gl	Gly	Glu	Glu	Arg	Leu	Leu	Trp	Leu	Tyr	Arg	Glu		
			420				425					430					

FIG. 1B

GTG	GAG	AGG	CCC	CTT	TCC	GCT	GTC	CTG	GCC	CAC	ATG	GAG	GCC	ACG	GGG	1464	
Val	Glu	Arg	Pro	Leu	Ser	Ala	Val	Leu	Ala	His	Met	Glu	Ala	Thr	Gly		
435				440							445						
GTG	CGC	CTG	GAC	GTG	GCC	TAT	CTC	AGG	GCC	TTG	TCC	CTG	GAG	GTG	GCC	1512	
Val	Arg	Leu	Asp	Val	Ala	Tyr	Leu	Arg	Ala	Leu	Ser	Leu	Glu	Val	Ala		
450				455						460							
GAG	GAG	ATC	GCC	CGC	CTC	GAG	GCC	GAG	GTC	TTC	CGC	CTG	GCC	GGC	CAC	1560	
Glu	Glu	Ile	Ala	Arg	Leu	Glu	Ala	Glu	Val	Phe	Arg	Leu	Ala	Gly	His		
465				470					475						480		
CCC	TTC	AAC	CTC	AAC	TCC	CGG	GAC	CAG	CTG	GAA	AGG	GTC	CTC	TTT	GAC	1608	
Pro	Phe	Asn	Leu	Asn	Ser	Arg	Asp	Gln	Leu	Glu	Arg	Val	Leu	Phe	Asp		
				485				490						495			
GAG	CTA	GGG	CTT	CCC	GCC	ATC	GGC	AAG	ACG	GAG	AAG	ACC	GGC	AAG	CGC	1656	
Glu	Leu	Gly	Leu	Pro	Ala	Ile	Gly	Lys	Thr	Glu	Lys	Thr	Gly	Lys	Arg		
				500				505						510			
TCC	ACC	AGC	GCC	GCC	GTC	CTG	GAG	GCC	CTC	CGC	GAG	GCC	CAC	CCC	ATC	1704	
Ser	Thr	Ser	Ala	Ala	Val	Leu	Glu	Ala	Leu	Arg	Glu	Ala	His	Pro	Ile		
				515			520				525						
GTG	GAG	AAG	ATC	CTG	CAG	TAC	CGG	GAG	CTC	ACC	AAG	CTG	AAG	AGC	ACC	1752	
Val	Glu	Lys	Ile	Leu	Gln	Tyr	Arg	Glu	Leu	Thr	Lys	Leu	Lys	Ser	Thr		
				530		535				540							
TAC	ATT	GAC	CCC	TTG	CCG	GAC	CTC	ATC	CAC	CCC	AGG	ACG	GGC	CGC	CTC	1800	
Tyr	Ile	Asp	Pro	Leu	Pro	Asp	Leu	Ile	His	555	Pro	Arg	Thr	Gly	Arg	Leu	
					550					555					560		
CAC	ACC	CGC	TTC	AAC	CAG	ACG	GCC	ACG	GCC	ACG	GGC	AGG	CTA	AGT	AGC	1848	
His	Thr	Arg	Phe	Asn	Gln	Thr	Ala	Thr	Ala	Thr	Gly	Arg	Leu	Ser	Ser		
				565				570						575			
TCC	GAT	CCC	AAC	CTC	CAG	AAC	ATC	CCC	GTC	CGC	ACC	CCG	CTT	GGG	CAG	1896	
Ser	Asp	Pro	Asn	Leu	Gln	Asn	Ile	Pro	Val	Arg	Thr	Pro	Leu	Gly	Gln		
				580			585						590				
AGG	ATC	CGC	CGG	GCC	TTC	ATC	GCC	GAG	GAG	GGG	TGG	CTA	TTG	GTG	GCC	1944	
Arg	Ile	Arg	Arg	Ala	Phe	Ile	Ala	Glu	Glu	Gly	Trp	Leu	Leu	Val	Ala		
				595			600				605						
CTG	GAC	TAT	AGC	CAG	ATA	GAG	CTC	AGG	GTG	CTG	GCC	CAC	CTC	TCC	GGC	1992	
Leu	Asp	Tyr	Ser	Gln	Ile	Glu	Leu	Arg	Val	Leu	Ala	His	Leu	Ser	Gly		
				610		615				620							
GAC	GAG	AAC	CTG	ATC	CGG	GTC	TTC	CAG	GAG	GGG	CGG	GAC	ATC	CAC	ACG	2040	
Asp	Glu	Asn	Leu	Ile	Arg	Val	Phe	Gln	Glu	Gly	Arg	Asp	Ile	His	Thr		
				625		630				635					640		
GAG	ACC	GCC	AGC	TGG	ATG	TTC	GGC	GTC	CCC	CGG	GAG	GCC	GTG	GAC	CCC	2088	
Glu	Thr	Ala	Ser	Trp	Met	Phe	Gly	Val	Pro	Arg	Glu	Ala	Val	Asp	Pro		
				645				650						655			

FIG. 1C

CTG	ATG	CGC	CGG	GCG	GCC	AAG	ACC	ATC	AAC	TTC	GGG	GTC	CTC	TAC	GGC		2136	
Leu	Met	Arg	Arg	Ala	Ala	Lys	Thr	Ile	Asn	Phe	Gly	Val	Leu	Tyr	Gly			
				660				665					670					
ATG	TCG	GCC	CAC	CGC	CTC	TCC	CAG	GAG	CTA	GCC	ATC	CCT	TAC	GAG	GAG		2184	
Met	Ser	Ala	His	Arg	Leu	Ser	Gln	Glu	Leu	Ala	Ile	Pro	Tyr	Glut	Glut			
				675			680				685							
GCC	CAG	GCC	TTC	ATT	GAG	CGC	TAC	TTT	CAG	AGC	TTC	CCC	AAG	GTG	CGG		2232	
Ala	Gln	Ala	Phe	Ile	Glu	Arg	Tyr	Phe	Gln	Ser	Phe	Pro	Lys	Val	Arg			
				690			695				700							
GCC	TGG	ATT	GAG	AAG	ACC	CTG	GAG	GAG	GGC	AGG	AGG	CGG	GGG	TAC	GTG		2280	
Ala	Trp	Ile	Glu	Lys	Thr	Leu	Glu	Glu	Gly	Arg	Arg	Arg	Gly	Tyr	Val			
				705			710			715				720				
GAG	ACC	CTC	TTC	GGC	CGC	CGC	CGC	TAC	GTG	CCA	GAC	CTA	GAG	GCC	CGG		2328	
Glu	Thr	Leu	Phe	Gly	Arg	Arg	Arg	Tyr	Val	Pro	Asp	Leu	Glu	Ala	Arg			
				725				730					735					
GTG	AAG	AGC	GTG	CGG	GAG	GCG	GCC	GAG	CGC	ATG	GCC	TTC	AAC	ATG	CCC		2376	
Val	Lys	Ser	Val	Arg	Glu	Ala	Ala	Glu	Arg	Met	Ala	Phe	Asn	Met	Pro			
				740			745			750								
GTC	CAG	GGC	ACC	GCC	GCC	GAC	CTC	ATG	AAG	CTG	GCT	ATG	GTG	AAG	CTC		2424	
Val	Gln	Gly	Thr	Ala	Ala	Asp	Leu	Met	Lys	Leu	Ala	Met	Val	Lys	Leu			
				755			760			765								
TTC	CCC	AGG	CTG	GAG	GAA	ATG	GGG	GCC	AGG	ATG	CTC	CTT	CAG	GTC	CAC		2472	
Phe	Pro	Arg	Leu	Glu	Glu	Met	Gly	Ala	Arg	Met	Leu	Leu	Gln	Val	His			
				770			775			780								
GAC	GAG	CTG	GTC	CTC	GAG	GCC	CCA	AAA	GAG	AGG	GCG	GAG	GCC	GTG	GCC		2520	
Asp	Glu	Leu	Val	Leu	Glu	Ala	Pro	Lys	Glu	Arg	Ala	Glu	Ala	Val	Ala			
				785			790			795				800				
CGG	CTG	GCC	AAG	GAG	GTC	ATG	GAG	GGG	GTG	TAT	CCC	CTG	GCC	GTG	CCC		2568	
Arg	Leu	Ala	Lys	Glu	Val	Met	Glu	Gly	Val	Tyr	Pro	Leu	Ala	Val	Pro			
				805			810			815								
CTG	GAG	GTG	GAG	GTG	GGG	ATA	GGG	GAG	GAC	TGG	CTC	TCC	GCC	AAG	GAG		2616	
Leu	Glu	Val	Glu	Val	Gly	Ile	Gly	Glu	Asp	Trp	Leu	Ser	Ala	Lys	Glu			
				820			825			830								
TGATACCAAC																2626		

FIG. 1D

Taq	659		663	667	671
E.coli	754		758	762	766
WT :	R	R A	A K	T I N	F G V
		S S		S V I	L I
		E N		T D	F
		P T		I L V	T
		G P		R	V
		K R		H	

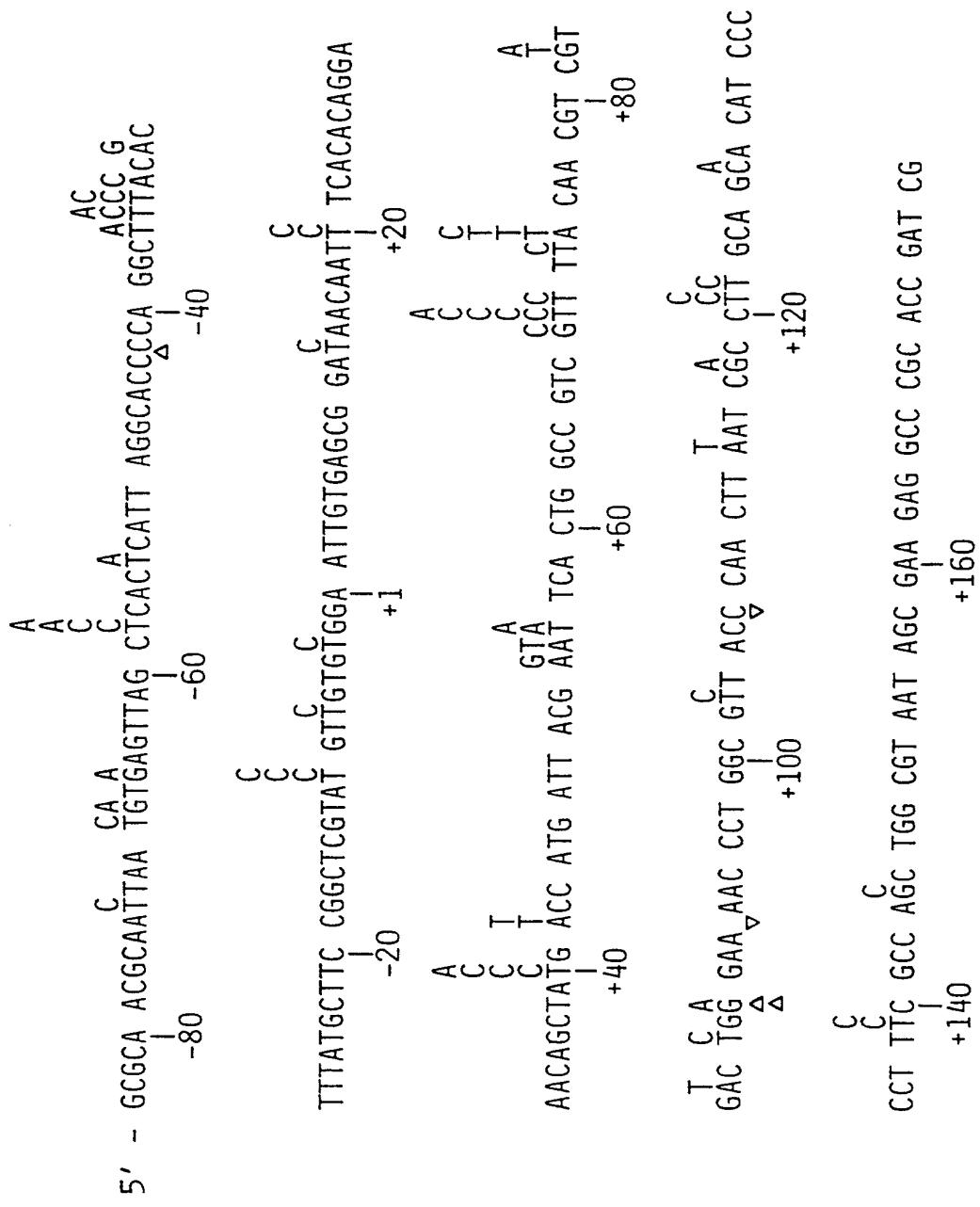
FIG. 2A

Taq	659	660	663	667	668
E.coli	754	755	758	762	763
WT :	R	R A	A K	T I N	F G V L Y
		Y			Y S Q R K
		P			
		G			
		S			
		I			
		K			
		W			
		C			
		A			

FIG. 2C

Taq	E.coli	659	754	R	A	K	663	758	T	P	S	R	I	N	F	G	V	I	L	T	F	F	T	T	I	L	I	Y	I	I	I	I	V						
WT	WT			R																																			
24																																							
36																																							
42																																							
65																																							
73																																							
75																																							
109																																							
117																																							
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252																																							
272																																							
280																																							
306																																							
307																																							
308																																							
44																																							
54																																							
74																																							
110																																							
219																																							
250																																							
30																																							
156																																							

FIG. 2B



3